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UTS BROADWAY BUILDING

NOISE IMPACT ASSESSMENT

TE914-01F05 (REV 3) NOISE IMPACT ASSESSMENT.DOC

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Prepared for:

University of Technology, Sydney

City Campus

Level 6, Building 10

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DOCUMENT CONTROL

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1 INTRODUCTION

Renzo Tonin & Associates were engaged to prepare a noise impact assessment to detail excessive noise that could be generated by the proposed development at the University of Technology, Sydney (UTS) on the corners of Jones Street, Broadway and Wattle Street, Ultimo. This noise impact assessment provides guidelines and general recommendations for the control of noise within the building and noise mitigation measures to the neighbouring properties to meet the Director-General's Requirements (DGR) Noise Key Assessment Requirements.

In accordance with relevant guidelines, this document:

- Identifies the potential sources of noise following occupancy of the proposed development;
- Specifies the noise criteria for the proposed development;
- Describes which actions and measures will need to be implemented to enable the noise criteria for the development and neighbouring properties be met.

The work documented in this report was carried out in accordance with the Renzo Tonin & Associates Quality Assurance System, which is based on the Australian Standard / NZS ISO 9001.

2 EXECUTIVE SUMMARY

This noise impact assessment provides guidelines and general recommendations for the control of noise generated by the building and noise mitigation measures to the neighbouring properties to meet the Director-General's Requirements (DGR) Noise Key Assessment Requirements.

This assessment identifies the potential sources of noise following occupancy of the proposed development and specifies the noise criteria for the proposed development. Actions and measures will need to be implemented to enable the noise criteria for the development and neighbouring properties are met. The noise mitigation options for the proposed building are outlined in this noise impact assessment.

3 PROJECT DESCRIPTION

3.1 Location

The proposed development is located on the corners of Jones Street, Broadway and Wattle Street, Ultimo and is bound by Jones Street to the east, Broadway to the south and Wattle Street to the west. UTS building CB10 bounds the site to the north and shares a common boundary with the site. Other UTS buildings to the east, commercial properties to the west and residential apartments to the northwest surround the site.

3.2 Noise Sources from the Proposed Development following Occupancy

3.2.1 Summary of Noise Sources that will have impact inside the proposed Building

1. Air Conditioning and Ventilation plant including chillers, air handling units and fans.
2. Diesel Generators, Tri-Generation plant and equipment.
3. Noisy Laboratory and Research equipment.
4. Other noisy equipments that are required for the occupancy and function of the building (to be advised by UTS at design development stage).

3.2.2 Summary of Noise Sources that will have impact on neighbouring buildings and properties

1. Cooling Tower, Condensing Units, Exhaust and Intake Fans and Plant Room Noise.
2. Noise from vehicular traffic entering and leaving the proposed building carpark.
3. Diesel Generators, Tri-Generation plant and equipment.
4. Noisy Laboratory and Research equipment.
5. Other noisy equipments that are required for the occupancy and function of the building (to be advised by UTS at design development stage).

3.2.3 Noise Sources that will have impact onto the proposed development

Noise sources such as traffic noise from nearby Wattle Street and Broadway and aircraft noise were identified as potentially impacting onto the building envelope. On the basis of the external noise impacting upon the building fabric of the education facility, appropriate design of the building envelope will be detailed to achieve a suitable indoor amenity for occupants and achieving the limits stipulated in Australian Standard AS2107:2000 "Recommended Design Sound Levels and Reverberation Times for Building Interiors".

4 EXISTING ACOUSTIC ENVIRONMENT

In order to establish an understanding of the existing noise level on the site, noise level measurements were conducted in 2010. Appropriately secure locations were unable to be found for long term, unattended noise monitoring. Instead, several short term attended background noise measurements were conducted during different periods of the day, corresponding to the construction hours, on Tuesday 15th June 2010 and Wednesday 16th June 2010. Measurements were conducted in the 'free field', away from any reflective surfaces.

The following noise monitoring locations were selected for the purpose of this assessment.

- **Location S1 – 513-519 Wattle Street, Ultimo**
  Western side of building on the footpath facing Wattle Street. The noise environment at this location was dominated by traffic noise from Wattle Street and distance traffic from Broadway. The background noise levels at this location are considered to be representative of the nearest residence.

4.1 Noise Monitoring Results

The results of the short term measurements are shown below.

Table 4.1 – Measured Existing Background (L_{90}) & Ambient (L_{eq}) Noise Levels, dB(A)

Location	L_{90} Background Noise Level	L_{eq} Ambient Noise Level
Location S1 – 513-519 Wattle Street	66	72

The acoustic treatment of the control of noise impact on the neighbouring buildings and noise intrusion into the proposed building will be based on the noise measurements in the above table.

5 ACOUSTIC CRITERIA FOR THE PROPOSED BUILDING

5.1 Indoor Noise Criteria impacting on the Indoor Occupants.

The indoor noise criteria for the proposed building will be in accordance with the recommendations set out in the Australian Standard 2107:2000 'Acoustics – Recommended design sound levels and reverberation times for building interiors'. Table 1 of the standard provides recommended design sound levels within internal areas.

Table 5.1 – AS2107:2000 Recommended Internal Design Sound Levels

Type of Occupancy	Recommended Design Sound Level, L_{Aeq}, dB(A)	
	Satisfactory	Maximum
Office areas	40	45
Conference Rooms	35	40
Corridors and lobbies	45	50
Lecture Rooms up to 50 seats	30	35
Lecture Theatres (with speech reinforcement)	35	45
Lecture Theatres (without speech reinforcement)	30	35
Laboratories - Teaching	35	45
Laboratories - Working	40	50
Engineering Workshops	50	60
Libraries (General Areas)	40	50
Libraries (Reading Areas)	40	45
Libraries (Stack Areas)	45	50
Audio Visual Areas	35	45

In addition to above, noise and vibration requirements set out by the NSW Department of Environment, Climate Change and Water will also be assessed against for noise and vibration impacts affecting external neighbours as a result of the operation of the UTS Broadway Building.

5.2 Environmental Noise Criteria

All external noise emissions impacting nearby sensitive receivers as a result of the operation of the UTS Broadway Building (eg. external mechanical plant and the roof top wind turbine which is used occasionally for research purposes) are assessed in accordance with the DECCW's 'Industrial Noise Policy' (INP). The assessment procedure in terms of the INP has two components:

- Controlling intrusive noise impacts in the short term for residences; and
- Maintaining noise level amenity for particular land uses for residences and other land uses.

Intrusiveness Criteria

According to the INP, the intrusiveness of a mechanical noise source may generally be considered acceptable if the equivalent continuous (energy-average) A-weighted level of noise from the source (represented by the L_{Aeq} descriptor), measured over a 15-minute period, does not exceed the background noise level measured in the absence of the source by more than 5dB(A). It is noted that this is applicable to residential properties only.

Therefore, the intrusiveness criterion for residential noise receptors as summarised in the INP is as follows:

$L_{Aeq,\ 15\ minute}$ ≤ Rating Background Level (L_{A90}) + 5 dB(A)

5.3 Amenity Criteria

To limit continuing increases in noise levels, the maximum ambient noise level within an area from industrial noise sources should not normally exceed the acceptable noise levels specified in Table 2.1 of the NSW INP, the applicable parts of which are reproduced below.

Nearby critical receivers consist of residential properties situated in an urban area, the UTS CB10 building and commercial premises. Based on the nature of these receivers, the following amenity criteria (L_{Aeq}) will be applied.

Table 5.2 – Amenity Noise Criteria, dB(A)

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Recommended L_{Aeq} Noise Level	
			Acceptable	Maximum
Residence[1]	Urban	Day	60	65
		Evening	50	55
		Night	45	50
School classroom - internal	All	Noisiest 1-hour period when in use	35	40
Commercial Premises	All	When in use	65	70

Notes: 1. Residential locations have been categorised as 'Urban'. Given that the existing noise environment is not influenced by existing industry, the Amenity Criteria have not been modified in accordance with Table 4.1, NSW INP.

As a general rule, masonry / brick type building structures would typically provide a 15dB(A) reduction from external noise levels to internal noise levels. Therefore, the equivalent external amenity noise criterion for the teaching areas of the UTS CB10 building would be **60dB(A)**.

6 NOISE MITIGATION OPTIONS

As the type of mechanical plant items are not yet finalised at this early stage of the design process, all mechanical plant, once selected, will have their noise specifications and their proposed locations checked prior to their installation on site, to ensure that they will not either singularly or in total emit noise levels which exceed the noise limits specified in Section 4 above.

If noise emissions from these plant items are calculated to be in excess of the set criteria at the affected receivers during the detailed design stage, then further appropriate acoustic treatment will be implemented to ensure compliance with the relevant noise criteria. In general, noise controls for mechanical plant are standard and commercially available, and can be readily added to silence any potentially noisy plant. Such noise control treatment may include any of the following:

- procurement of 'quiet' plant;
- installation of commercially available silencers over noisy fans;
- installation of acoustic screens and barriers between plant and sensitive neighbouring premises;
- installation of partially-enclosed or fully-enclosed acoustic enclosures over plant;
- incorporation of suitable building façade and glazing to control noise intrusion into the building,
- installation of specific acoustic treatment for the building air conditioning, ventilation and hydraulic services.

7 CONCLUSION

The guidelines and criteria to address the noise impact assessment to detail excessive noise that could be generated by the proposed development at the University of Technology, Sydney (UTS) on the corners of Jones Street, Broadway and Wattle Street, Ultimo has been outlined.

Detail design of the proposed building envelope and associated services will be undertaken at the design development and contract documentation stage to achieve the criteria outlined above. It can be predicted that the proposed development is capable of complying with the applicable noise criteria outlined in this report by incorporating the appropriate noise control measures.

The study of external noise intrusion into the subject development has found that appropriate controls can be incorporated into the building design to achieve a satisfactory accommodation environment consistent with the intended quality of the building and relevant standards.